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ABSTRACT

A comprehensive Instrument for Curriculum Evaluation (ICE) was developed to qualitatively and quantitatively evaluate curriculum materials. The instrument contains 115 statements for assessing 11 aspects of curriculum: philosophy, needs assessment, theme, goals, learning objectives and standards, scope and sequence, field testing, instructor materials, learner materials, learning assessment materials, and cost. A five-point Likert scale, ranging from "very poor" to "very good", is used to evaluate curriculum materials. In addition, a "not applicable" option is listed with each question to aid in accurately rating a variety of curricula for which all 11 aspects may not be included, as well as a comment section for each aspect for open-ended responses. The ICE was examined by a panel of experts for consensual validity and field tested by two groups for interrater reliability, ease of use, and effectiveness. The ICE can be used in formative and summative evaluations by assessing materials during the planning and piloting stages. It is best used with a panel of evaluators. The ICE is provided. (Author/TJH)

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INSTRUMENT FOR CURRICULUM EVALUATION

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A comprehensive Instrument for Curriculum Evaluation (ICE) was developed to qualitatively and quantitatively evaluate curriculum materials. The instrument contains 115 statements for assessing eleven aspects of curriculum: philosophy, needs assessment, theme, goals, learning objectives and standards, scope and sequence, field testing, instructor and learner materials, learning assessment materials and cost. A five-point Likert scale, ranging from "very poor" to "very good", is used to evaluate curriculum materials. In addition, a "not applicable" option is listed with each question to aid in accurately rating a variety of curricula for which all eleven aspects may not be included, as well as a comment section for each aspect for open-ended responses. ICE was examined by a panel of experts for consensual validity and field tested for interrater reliability, ease of use and effectiveness by two groups.

INTRODUCTION

The Instrument for Curriculum Evaluation (ICE) was developed to provide a precise tool for comprehensively assessing the quality of curriculum materials. The instrument was modified several times during its' developmental stage. For quality control measures, ICE was subjected to formative evaluation by two groups: it was critiqued by health education graduate students, using an evaluation form developed by Stacy (1987); and content validity was assessed by a panel of five individuals with

expertise in curriculum, research methods, instructional design, and instructional strategies.

ICE has been field tested twice. The first field test focused on a curriculum dealing with infectious diseases, designed as an educational seminar for homemakers and choreworkers employed by a regional agency on aging. The second field test, using a modified version of ICE, examined a birth control workshop curriculum delivered by staff at a university wellness center.

TECHNICAL CHARACTERISTICS OF INSTRUMENT

Based on a review of curriculum and evaluation literature, and field test recommendations, a 115 item Instrument for Curriculum Evaluation (ICE) was developed. ICE categories are:

1) Philosophy
2) Needs Assessment
3) Theme
4) Goals
5) Learning Objectives and Standards
6) Scope and Sequence
7) Field Testing
8) Instructor Materials
    a. lesson plan components
    b. instructional strategies
    c. logistics and ease of use
9) Learner Materials
    a. content

b. properties

10) Learning Assessment Materials

11) Cost

Philosophy, needs assessment, theme and goals are broad areas which give a framework and purpose to the curriculum. They give focus to outcomes, clarify emphasis, justify existence of the curriculum and reflect needs, underlying ideas and approaches (Christensen, 1986; Fodor & Dalis, 1989; Rokoff & Abram, 1985; Vermont State Department of Education, 1986).

Learning objectives and standards define the tasks that the learner is expected to do, the conditions under which the learner performs the task, and the criterion which the learner must meet (Mager, 1975). Included in each objective statement is a content dimension and a behavioral dimension (Fodor & Dalis, 1989; Tyler, 1949). The five types of objectives which may or may not be appropriate for all curricula and/or settings are information acquisition, skill development, concept development, opinion development and expression, and values awareness (Fodor & Dalis, 1989). These five types of objectives expand and clarify previous classifications of objectives which were cognitive, psychomotor, and affective (Bloom, 1971; Lavaroni, 1985).

Scope is the breadth and depth of the curriculum or topic coverage. Sequence describes the orderly and developmental progression of topics and learning (Christensen, 1986, Curtis & Papenfuss, 1980). Tyler (1949)

recommends developing "organizing threads" or key concepts and skills which help achieve continuity, order and integration. Organizing principles form the basis of the elements which will be broadened and deepened. From these elements,

> continuity involves the recurring emphasis in the learner's experience upon these particular elements; sequence refers to the increasing breadth and depth of the learner's development; and integration refers to the learner's increased unity of behavior in relating to the elements involved (Tyler, 1949, p. 96).

After focusing on philosophy, theme, goals, objectives, scope and sequence, it might appear that the most important elements of curriculum development are completed. However, it is necessary to appraise a curriculum in more exact conditions: field testing and pilot testing (Tyler, 1949). Field testing refers to the process evaluation techniques of curriculum readability tests (Windsor, Baranowski, Clark, and Cutter, 1984) and pilot testing for modification prior to implementation.

Additional elements which comprise a well-planned curriculum are instructor materials and other resources. Components of the curriculum lesson plan of instructor materials are based on Gagne's (1977, Gagne & Briggs, 1979) events of instruction. Logistics and ease of use of the instructor materials focus on the logical sequence of the instructional plans, cues which aid audience understanding

and mastery, and guidelines for implementing the curriculum. Physical properties of learner and learning assessment materials address the characteristics and qualities of all resources used to enhance and facilitate learning including posters, handouts, audio and visual aids, and other equipment, or measure learning such as quizzes and tests (Gall, 1981). The cost of the curriculum considers the price, purchase procedures, and organizational resources.

A systematically constructed curriculum has congruency within and between the categories of philosophy, theme, goals, objectives, scope and sequence, lesson plans, and instructional strategies. For example, the match between goals and content, and the match between goals and learning assessment content, should be complementary (Christensen, 1986). The sequence diagram of ICE illustrates the congruence and overlap which should be considered in developing or evaluating a curriculum (See Figure 1).

Figure 1 illustrates graphically the ideas that philosophy is the broad umbrella from which a curriculum is developed. A needs assessment aids in giving direction to the theme, goals, objectives and scope and sequence. Field testing of instructor and learner materials identifies strengths and weaknesses and checks the validity and functionality of the instructional program. However, regardless of academic and field testing critiques, cost of the curriculum is the bottom line, a crucial factor in adoption of a curriculum.

Evaluation responses for each item are ranked on a five point Likert-type scale of 1) very poor, 2) poor, 3) fair, 4) good, and 5) very good. These response options were chosen in order to provide more accurate feedback to the curriculum developer on strengths and weaknesses. The questions are worded so that high numbers would be given for positive responses. A "not applicable" choice with a zero score is available for every item. An overall score is computed by dividing the total score by the number of items rated (subtract out "not applicable" choices before dividing). A rating from 1.0 - 1.9 is poor, 2.0 - 4.0 is good, and 4.1 - 5.0 is very good. Following each major section of items, space is provided for open-ended responses.

RECOMMENDATIONS

ICE can be used in formative and summative evaluations by assessing materials during the planning and piloting stages. It can also be used in quality control to systematically evaluate a curriculum for unity in philosophy, theme, goals, objectives, and scope and sequence of instructor and learner materials prior to purchasing a curriculum. ICE is best used with a panel of evaluators. After all panel members have completed an evaluation of the curriculum, compare the scores, means and standard deviations of each item. Items with low panel scores will help identify weaknesses which may need to be addressed.

Before using ICE to evaluate a curriculum the authors recommend a meeting of the evaluators to:

1) review the instrument to ensure understanding of all terms and statements on the instrument, and
2) eliminate categories of ICE which are not applicable to the particular curriculum being evaluated.

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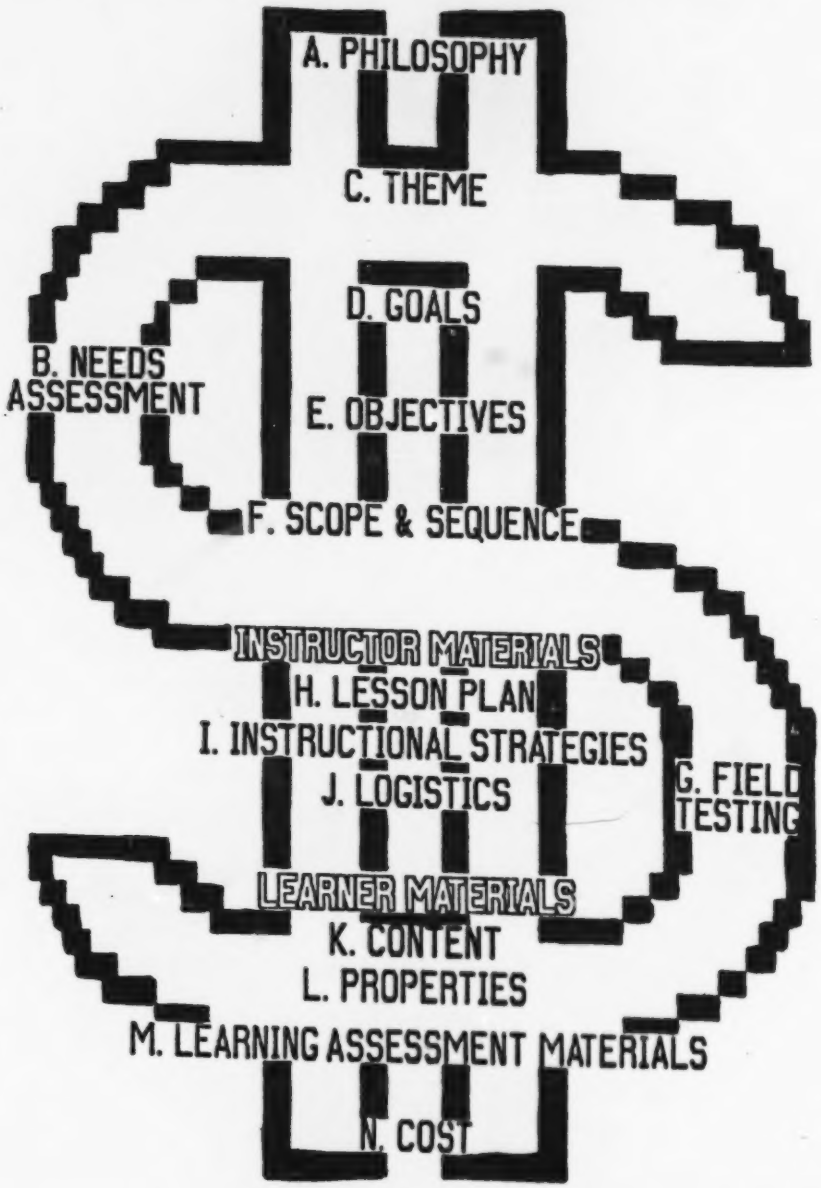
FIGURE 1

INSTRUMENT FOR CURRICULUM EVALUATION:

SEQUENCE FOR ASSESSING CURRICULUM MATERIALS



Note. The letters identified with each category correspond with the outline letters on the Instrument for Curriculum Evaluation.

The instrument for curriculum evaluation (ICE) provides a precise tool for assessing the quality of curriculum materials. It can be used by curriculum planners during early stages as a checklist to aid proper development, as well as after development by school boards and others wishing to select a curriculum for adoption. It is appropriate for any content area or instructional setting.

Each category, containing a list of items, can be used individually, or as a whole. It is important that appropriate categories for the instructional circumstance be selected for evaluation. Evaluators should pick and choose categories for appropriate use.

Open comment sections with each category allows evaluators to express expanded individualized responses. In addition, the not applicable (NA) option is provided for response to each item inappropriate for the instructional circumstance.

DIRECTIONS: Circle the number which corresponds with your assessment of how well the curriculum materials fulfill each statement.

0 = NA = NOT APPLICABLE
1 = VP = VERY POOR
2 = P = POOR
3 = F = FAIR
4 = G = GOOD
5 = VG = VERY GOOD

A. PHILOSOPHY - statement of purpose, justification of content

		NA	VP	P	F	G	VG
1	The organizational philosophy is clearly stated	0	1	2	3	4	5
2	The curriculum is justified in the organizational philosophy	0	1	2	3	4	5
3	The sequence of the comprehensive or total curriculum shows developmental progression	0	1	2	3	4	5

Comments_____

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B. NEEDS ASSESSMENT - analysis of status quo with perceived and real needs of learners

		NA	VP	P	F	G	VG
4	Needs of the organization were assessed	0	1	2	3	4	5
5	Needs of the learners were assessed	0	1	2	3	4	5
6	Priorities of needs were established	0	1	2	3	4	5
7	Priorities were determined systematically	0	1	2	3	4	5

Comments_____

_____

C. THEME OF CURRICULUM - underlying idea of instructional approach

		NA	VP	P	F	G	VG
8	Theme:						
	a. runs throughout the curriculum	0	1	2	3	4	5
	b. reflects critical areas which education should address	0	1	2	3	4	5
	c. is shaped to accomodate emerging educational priorities	0	1	2	3	4	5
	d. is shaped to accomodate and respond to legislative priorities	0	1	2	3	4	5
	e. is flexible in order to allow inclusion of contemporary, vital programs	0	1	2	3	4	5

Comments_____

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D. INSTRUCTIONAL GOALS - broad, general statements reflecting educational beliefs or assumptions

		NA	VP	P	F	G	VG
9	Instructional goals:						
	a. are consistent with contemporary education trends	0	1	2	3	4	5
	b. match the organizational philosophy	0	1	2	3	4	5
	c. match local requirements	0	1	2	3	4	5
	d. match state requirements	0	1	2	3	4	5
	e. are broad statements of the curriculum	0	1	2	3	4	5
	f. set a framework for determining appropriate knowledge base	0	1	2	3	4	5
	g. organize curriculum into a logical and coherent structure	0	1	2	3	4	5

Comments_____

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E. LEARNING OBJECTIVES AND STANDARDS - Specific statements of learner behavior.

Three components of objectives: (1) performance or task, (2) condition, and (3) standards or criteria.

Three types of objectives: (1) Cognitive = knowledge, (2) affective = attitude, (3) psychomotor = skill

		NA	VP	P	F	G	VG
10	Learning objectives:						
	a. match instructional goals	0	1	2	3	4	5
	b. are specific, and measurable behavioral statements	0	1	2	3	4	5

		NA	VP	P	F	G	VG
11	Learning objectives represent:						
	a. cognitive domain	0	1	2	3	4	5
	b. affective domain	0	1	2	3	4	5
	c. psychomotor domain	0	1	2	3	4	5
12	Standards of measurable behavior are stated in learning objectives	0	1	2	3	4	5
13	Standards of behavior are set according to accepted measurement procedures	0	1	2	3	4	5
14	Conditions under which objectives are assessed are appropriate for learner capabilities	0	1	2	3	4	5

Comments_____

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F. SCOPE AND SEQUENCE OF CURRICULUM - scope = breadth and depth, sequence = planned, developmental, and progressive

		NA	VP	P	F	G	VG
15	Scope:						
	a. is clearly stated	0	1	2	3	4	5
	b. of the content matches objectives	0	1	2	3	4	5
16	Rationale for scope is stated	0	1	2	3	4	5
17	Content is of appropriate scope given time for program	0	1	2	3	4	5
18	The sequence:						
	a. is explicitly stated	0	1	2	3	4	5
	b. of content shows developmental progression	0	1	2	3	4	5
19	Rationale for sequence is stated	0	1	2	3	4	5
20	Content fits the developmental sequence of the comprehensive curriculum	0	1	2	3	4	5
21	The content topics are linked by transitions	0	1	2	3	4	5

Comments_____

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G. FIELD TESTING OF CURRICULUM - all methods of testing and evaluation prior to actual implementation

		NA	VP	P	F	G	VG
22	Curriculum was properly field tested	0	1	2	3	4	5
23	Results of field test were used to modify the curriculum	0	1	2	3	4	5
24	A readability test was applied to the curriculum	0	1	2	3	4	5

		NA	VP	P	F	G	VG
25	Results of readability test were reported	0	1	2	3	4	5
26	Results of the readability test were used to modify curriculum	0	1	2	3	4	5
27	Reported readability rating matches evaluator rating	0	1	2	3	4	5

Comments_____

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H. LESSON PLAN COMPONENTS OF INSTRUCTOR MATERIALS - sequential format of instruction

		NA	VP	P	F	G	VG
28	Curriculum lesson plan includes:						
	a. an appropriate method to gain attention	0	1	2	3	4	5
	b. the learner objectives	0	1	2	3	4	5
	c. probing questions to stimulate recall	0	1	2	3	4	5
	d. stimulus material	0	1	2	3	4	5
	e. learner opportunities to practice skills	0	1	2	3	4	5
	f. clarification of terms	0	1	2	3	4	5
	g. methods for cognitive mastery	0	1	2	3	4	5
	h. examples to clarify concepts	0	1	2	3	4	5
	i. skill practice in developmental progression	0	1	2	3	4	5
	j. instructor cues for learner feedback	0	1	2	3	4	5
	k. an evaluation assessment of learner performance	0	1	2	3	4	5
	l. a method for enhancing retention and transfer of knowledge	0	1	2	3	4	5

Comments_____

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I. INSTRUCTIONAL STRATEGIES IDENTIFIED IN INSTRUCTOR MATERIALS - teaching methods and learning activities

		NA	VP	P	F	G	VG
29	Instructional strategies match:						
	a. cognitive learning objectives	0	1	2	3	4	5
	b. affective learning objectives	0	1	2	3	4	5
	c. psychomotor learning objectives	0	1	2	3	4	5
	d. content scope	0	1	2	3	4	5
	e. content sequence	0	1	2	3	4	5

		NA	VP	P	F	G	VG
30	Instructional strategies are appropriate for:						
	a. age of learners	0	1	2	3	4	5
	b. background and experience of learners	0	1	2	3	4	5
	c. size of learner group	0	1	2	3	4	5
	d. the instructional setting	0	1	2	3	4	5
31	More than one instructional strategy is used to provide options for individuals	0	1	2	3	4	5
32	Instructional strategies:						
	a. use creative approaches	0	1	2	3	4	5
	b. allow learner adequate practice for mastery of skills	0	1	2	3	4	5
	c. include statements of rationale for use	0	1	2	3	4	5

Comments_____

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J. LOGISTICS AND EASE OF USE OF INSTRUCTOR MATERIALS - guides and cues for the instructor to enhance curriculum implementation

		NA	VP	P	F	G	VG
33	Curriculum is easily implemented	0	1	2	3	4	5
34	Instructional cues are provided for the instructor	0	1	2	3	4	5
35	A schedule for objective attainment exists	0	1	2	3	4	5
36	Time allotment for topics is planned	0	1	2	3	4	5
37	Curriculum materials state special equipment needs (e.g. projector)	0	1	2	3	4	5
38	Alternative activities are provided for flexibility in presentation	0	1	2	3	4	5
39	Optional activities are provided to lengthen instruction	0	1	2	3	4	5
40	Guidelines are provided to shorten instruction	0	1	2	3	4	5
41	An instructors guide is provided	0	1	2	3	4	5
42	Information for instructor qualifications is given	0	1	2	3	4	5

Comments_____

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K. CONTENT OF LEARNER MATERIALS - topics in handouts, posters, audio and visual aides, equipment, and other resources

		NA	VP	P	F	G	VG
43	Content of learner materials:						
	a. matches scope	0	1	2	3	4	5
	b. matches sequence	0	1	2	3	4	5
	c. matches learning objectives	0	1	2	3	4	5
	d. contains material only stated in objectives	0	1	2	3	4	5
	e. is accurate	0	1	2	3	4	5
	f. is current	0	1	2	3	4	5
	g. contains theoretical material	0	1	2	3	4	5
	h. contains practical material	0	1	2	3	4	5
	i. is written in a consistent format	0	1	2	3	4	5
	j. is appropriate for learner background/experience	0	1	2	3	4	5

Comments_____

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L. PROPERTIES OF LEARNER MATERIALS - qualities of handouts, audio and visual aides, equipment, and other resources

		NA	VP	P	F	G	VG
44	Learner Materials are:						
	a. free from stereotypes	0	1	2	3	4	5
	b. multicultural	0	1	2	3	4	5
	c. appropriate for the instructional setting	0	1	2	3	4	5
	d. appropriate for age of audience	0	1	2	3	4	5
	e. attractive	0	1	2	3	4	5
	f. legible	0	1	2	3	4	5
	g. neat	0	1	2	3	4	5
	h. durable	0	1	2	3	4	5
	i. constructed from quality products	0	1	2	3	4	5
	j. safe	0	1	2	3	4	5
	k. motivational	0	1	2	3	4	5
	l. compatible with each other	0	1	2	3	4	5
	m. easy to use	0	1	2	3	4	5
	n. easily identified	0	1	2	3	4	5
45	Materials contain date of publication	0	1	2	3	4	5
46	A list of all curriculum materials is provided	0	1	2	3	4	5
47	Readability level of materials is appropriate for audience *	0	1	2	3	4	5

Comments_____

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M. LEARNING ASSESSMENT MATERIALS - all methods of testing, assessing and evaluating learner performance

		NA	VP	P	F	G	VG
48	Test items match learning objectives	0	1	2	3	4	5
49	Tests contain a variety of types of questions (e.g. multiple choice, T/F)	0	1	2	3	4	5
50	Materials contain a variety of assessment devices	0	1	2	3	4	5
51	Accurate answer keys are provided	0	1	2	3	4	5
52	Tests were evaluated for reliability	0	1	2	3	4	5
53	Tests were evaluated for validity	0	1	2	3	4	5
54	Pre and post assessment are suited to the audience	0	1	2	3	4	5
55	Readability level is appropriate for audience *	0	1	2	3	4	5

Comments_____

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* Determining readability level using the SMOG formula:
1. Count off 10 consecutive sentences near the beginning, in the middle, and near the end of the text.
2. From this sample of 30 sentences, count all words with 3 or more syllables.
3. Estimate the square root of the total number of 3 or more syllable words.
4. Add three to the square root.
5. This number is the SMOG reading grade level.

(Windsor et al., 1984)

N. COST OF CURRICULUM - price considerations for purchase

		NA	VP	P	F	G	VG
56	Cost of the materials is reasonable	0	1	2	3	4	5
57	Purchase procedures are clear and easy to follow	0	1	2	3	4	5
58	Organization has resources required for use of materials	0	1	2	3	4	5
59	Cost of materials is within budget	0	1	2	3	4	5

Comments_____

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